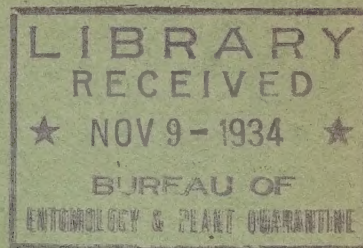


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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF CHEMISTRY AND SOILS
INSECTICIDE DIVISION

Patent List No. 20



A LIST OF
UNITED STATES PATENTS
Issued from 1917 to 1933 inclusive

relating to
FUMIGATING DEVICES

Compiled by

R. C. Roark

Washington, D. C.
August, 1934.

A LIST OF UNITED STATES PATENTS ISSUED FROM 1917 TO 1933, INCLUSIVE,
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Insecticide Division, Bureau of Chemistry and Soils.

This list of 136 patented devices includes 16 for applying liquid hydrocyanic acid, 7 for applying calcium cyanide, and 8 for applying sulphur dioxide. Other fumigants handled by various kinds of apparatus include carbon disulphide, formaldehyde, fumes from burning arsenic, oil, pyrethrum, tobacco, and other combustibles, carbon dioxide, carbon monoxide, carbon tetrachloride, cyanogen chloride, hydrocyanic acid, hydrogen sulphide, sulphur dioxide, trichloronitromethane, ammonia, naphthalene, paradichlorobenzene, citronella oil, cedar-wood oil, methyldichloramine, and nicotine.

Devices are described for putting fumigating tents over citrus trees, for smoking bees, for fumigating rat burrows, insects in soil, upholstered furniture, grain, and poultry. Machines for applying steam to insects and for distributing liquid insecticide by a blast of steam are described.

Every effort has been made by the compiler to make this list of patents complete and no discrimination is intended against any patent mention of which is inadvertently omitted.

The Department of Agriculture assumes no responsibility for the merits or workableness of any of the patents, nor does it recommend any of the inventions listed.

1,213,129 (Jan. 16, 1917; appl Oct. 26, 1916.) CHICKEN-RENOVATOR. Robert E. Pack, Sioux City, Iowa. - This device consists of a sheet-metal box in which a fowl is placed with its head protruding through an opening. Absorbent material in the box such as sawdust is saturated with a suitable liquid whose fumes will kill the parasites on the fowl.

1,219,096 (Mar. 13, 1917; appl. Dec. 2, 1916.) APPARATUS FOR DESTROYING INSECTS. Robert W. Geeslin, Caradan, Tex. - This device consists of a receptacle holding a fumigant and provided with a perforated shaft or chimney through which the fumigant vapor passes. The device is intended for destroying weevils in a bin of grain.

1,225,627 (May 8, 1917; appl. Feb. 20, 1915). FUMIGATING APPARATUS. Fletcher M. Hawkins, Greenville, Tex. - This machine burns sulphur and blows the fumes through a nozzle to fumigate a room, a rat burrow or a pile of straw.

1,233,871 (July 17, 1917; appl. Oct. 20, 1916). DEVICE FOR KILLING VERMIN ON LIVE STOCK. Thomas W. Graham, Myrtle, Miss. - This apparatus blows a strong current of air saturated with fumes from a suitable chemical solution upon animals as they pass through a housing. The exhaust from a gas engine also assists in blowing vermin from the animals.

1,234,111 (July 24, 1917; appl. July 3, 1916.) VERMIN-DESTROYER FOR FOWLS. Jacob T. Alderson and Sue F. Alderson, Sutherlin, Va. - This device consists of a box for holding a fowl with its head outside and fumigating it with fumes from burning tobacco or burning sulphur.

1,245,685 (Nov. 6, 1917; appl. Jan. 30, 1917). EXTERMINATOR. Julio Conceicao, Santos, Brazil. - This apparatus for applying a gaseous or liquid insecticide to the soil is provided with a window which permits the operator to observe the application of the insecticide.

1,259,230 (Mar. 12, 1918; appl. Aug. 21, 1915). INSECT-EXTERMINATOR. Paul G. Hanzadian, Nashua, N.H. - This portable device for applying steam to insects consists of a generator in the form of a coffee pot. Burning liquid fuel supplied from a reservoir generates steam which escapes through a spout.

1,287,389 (Dec. 10, 1918; appl. Feb. 5, 1917). FUMIGATING DEVICE. Norris O. Mellott, Harper, Calif. - This knock-down box-like device is designed to be set up about a tree for the purpose of confining a fumigating gas.

1,292,624 (Jan. 28, 1919; appl. Jan. 9, 1918). RAT-POISONING DEVICE. Grover C. Magness, Sardis, La. - This device consists of a tube with pointed end and perforations in the lower part. A sponge soaked in a suitable solution the major portion of which is CS_2 is placed in the tube which is then stoppered. This tube is thrust into grain to poison any rodents.

1,295,079 (Feb. 18, 1919; appl. July 22, 1918). APPARATUS FOR OPERATING FUMIGATING-TENTS. William H. Stone, Los Angeles, Calif. - This device is mounted on a truck and is designed for dropping a fumigating tent over a tree.

1,295,397 (Feb. 25, 1919; appl. Apr. 24, 1918). MACHINE FOR EXTERMINATING RODENTIA OR THE LIKE. Ben Watts, Jarbidge, Nev. - FortY-Nine One-Hundredths to Warren P. Godfrey, Jarbidge, Nev. - This machine is adapted to be supported by the body of the operator together with manually operating means for creating a current of air to effect the desired discharge of fumes or vapors fatal to animal life such as ground squirrels, rats and other rodentia.

1,299,309 (April 1, 1919; appl. Apr. 17, 1918). APPARATUS FOR THE PRODUCTION OF GERMICIDE, INSECTICIDE, AND LIKE GASES.

Leon Durand, Paris, and Georges Bottin, Rue Turpin-Romans, France. - This apparatus is designed to fumigate a room by burning sulphur, by liberating liquified SO_2 and by volatilizing formaldehyde solution.

1,304,747 (May 27, 1919; appl. May 5, 1917). METHOD OF FUMIGATING. William G. Dingle, Los Angeles, Calif. - This method of fumigating consists in spraying liquid HCN into an enclosed space at a temperature suitable for the gasification of the liquid.

1,309,193 (July 8, 1919; appl. Nov. 30, 1918). RODENT-EX-TERMINATOR. Jacob T. Garrison, Oakland, Calif. - This device consists of a combustion chamber and an air pump for forcing the asphyxiating fumes through a flexible tube into a burrow.

1,312,223 (Aug. 5, 1919; appl. Dec. 24, 1918). VERMIN-EX-TERMINATOR. Will R. Woodruff, Stanton, Neb. - A volatile poisonous liquid is forced from a cylinder into gopher burrows and other places by compressed air from a hand pump.

1,322,149 (Nov. 18, 1919; appl. Nov. 1, 1918). FUMIGATING-TENT. Mack M. Swain, Los Angeles, Calif. - Forty One-Hundredths to Chester C. Conklin. - A system of balloons for lifting a fumigating tent over a citrus tree is described.

1,332,109 (Feb. 24, 1920; appl. June 9, 1919). FUMIGATING APPARATUS. Francisco de Asis del Valle, San Juan, Porto Rico. - This apparatus is designed for the production of hydrogen cyanid by the action of acid upon a solution of sodium cyanid. The apparatus is operated electrically at a distance.

1,336,822 (Apr. 13, 1920; original appl. Aug. 9, 1918; divided and this appl. July 2, 1919) APPARATUS FOR GASIFYING LIQUIDS. Edward H. Cuyler and Mark B. Patterson, Los Angeles, Calif. - The Pacific R. & H. Chemical Corp., Los Angeles, Calif. - This portable apparatus measures and vaporizes liquid hydrocyanic acid for use in tree fumigation under tents.

1,355,489 (Oct. 12, 1920; appl. July 2, 1919). FUMIGATOR AND POISON-DISTRIBUTOR. John E. McLeod, Washington, Kans. - This portable apparatus forces poisonous gases formed by combustion into the burrows of rodents by means of a pump.

1,371,801 (Mar. 15, 1921; appl. May 27, 1919). FUMIGATOR. Thomas Mayes, Alma, Mich. - This bee smoker is composed of telescopic sections and smoke is forced through by a bellows.

1,372,974 (Mar. 29, 1921; appl. Jan. 3, 1920). FUMIGATING-COVER. Austin W. Morrill, Los Angeles, Calif. - This box-type fumigating device is provided with a gas tight cover for use in fumigating small trees.

1,377,273 (May 10, 1921; appl. June 19, 1919). CHINCH-BUG KILLER. John A. Perrings, Springfield, Ill. - A vaporizable insecticide held in a cartridge is heated by burning punk until the gas produced blows out the stopper. The contents fall into a heated pan, are vaporized and destroy chinch bugs on the surrounding crop.

1,386,125 (Aug. 2, 1921; appl. Sept. 16, 1918). FUMIGATOR. Henry Leob, New York, N.Y. - This portable apparatus is carried to plants to be fumigated. Fumes from a sulphur candle or other suitable material pass into a reservoir from which they are blown upon the plants by air under pressure.

1,386,283 (Aug. 2, 1921; appl. June 8, 1920) BEE-SMOKER. Orville W. Shrader, Boaz, Ala. - This bee smoker is constructed so that the temperature of the smoke may be varied. The smoke is blown through a spout by a collapsible bellows.

1,400,598 (Dec. 20, 1921; appl. Mar. 23, 1920). APPARATUS FOR PRODUCING NOXIOUS GASES AND METHOD OF ASPHYXIATING OBNOXIOUS ANIMALS. Gates M. Fowler, Los Angeles, Calif. - Combustion gases such as CO and CO₂ from a charcoal fire are forced by a fan into the burrows of rodents. Carbon disulphide formed by the reaction of sulphur vapor with CO₂ in the apparatus may be added. Arsenic or a suitable oil may be burned. The exhaust gases from the internal combustion engine that runs the fan are also forced into the burrows.

1,401,293 (Dec. 27, 1921; appl. Apr. 11, 1921). PORTABLE CHLORINE-DISPENSOR. James W. Van Meter, San Francisco, Calif. - Chlorine from this small pressure cylinder is liberated through a gage containing water or kerosene. This apparatus is useful for fumigating insects or gophers.

1,419,653 (June 13, 1922; appl. Aug. 31, 1920). PORTABLE APPARATUS FOR GENERATING POISONOUS GASES. James W. Van Meter, San Francisco, Calif. - This apparatus generates cyanogen chloride by the action of chlorine on potassium cyanide in the presence of metallic particles such as metallic arsenic or metallic filings.

1,422,831 (July 18, 1922; appl. Aug. 9, 1920). VERMIN EXTERMINATOR. William W. Camp, Denver, Colo. - This device consists of a perforated pointed tube adapted to be driven into the soil and to receive an exterminating fluid which is forced out by compressed air from a pump. The apparatus is intended for exterminating vermin which burrow in the ground.

1,426,831 (Aug. 22, 1922; appl. June 29, 1921). APPARATUS FOR MEASURING AND GASIFYING LIQUIDS. Mortimer J. Brown, Los Angeles, Calif. - The Pacific R. & H. Chemical Corp., Los Angeles, Calif. - This apparatus measures and gasifies measured changes of volatile liquid, especially liquid HCN.

1,430,772 (Oct. 3, 1922; appl. Sept. 12, 1921). CHEMICAL CARTRIDGE. James W. Van Meter, San Rafael, Calif. - This paper cartridge holds sawdust, rice hulls or similar material mixed with a metallic powder such as zinc, iron or lead and a glass tube of water or other liquid. Chlorine is introduced into the cartridge from a pressure cylinder and reacting with the metallic powder generates enough heat to vaporize the liquid and force it out of the cartridge. Salts of cyanide, arsenic, sulphur, etc. may be added to the cartridge. Reference is made to United States Patent 1,403,461 granted Jan. 10, 1922 to J. W. Van Meter.

1,454,154 (May 8, 1923; Jan. 25, 1921). METHOD OF AND APPARATUS FOR FUMIGATING. Kenneth F. Cooper, Great Neck, N. Y. - American Cyanamid Co. New York, N.Y. - An apparatus for applying volatile liquid fumigants, more particularly liquid hydrocyanic acid in rooms and ships' holds is described. A process of fumigating consists in mixing an inert gas (air) with the fumigant, heating, and introducing the superheated mixed gas and vapor into the space to be fumigated.

1,459,217 (June 19, 1923; appl. Mar. 29, 1922). FUMIGATION TENT. Emil A. Klein, Los Angeles, Calif. - This gas tight tent may be placed over a tree without subjecting the tree to the weight of any part of the tent. It has a permanent extended pivoted top which may be swung to position over the top of the tree.

1,468,230 (Sept. 18, 1923, appl. Oct. 27, 1922). MACHINE FOR EXTERMINATING INSECTS. Eligah H. Field and William H. Holman. Buford, Ga. - This machine is provided with a hood for covering plants in the field while they are being subjected to the action of poisonous gases. These gases are generated by burning chemicals in a stove.

1,491,506 (Apr. 22, 1924; appl. June 23, 1923). FUMIGATOR AND INSECT DESTROYER. Thomas C. Wormley, San Antonio, Tex. - One-Half to H. M. Prue, San Antonio, Tex. - This device is designed to have a fumigating candle burned therein and is provided with means for directing the fumes downwardly so as to cover the ground with a blanket of insecticide fumes. For use against boll weevils in cotton fields, four fumigators per acre are used, distributed at suitable intervals.

1,497,428 (June 10, 1924; appl. June 17, 1923). METHOD OF AND APPARATUS FOR FUMIGATION. Frederick W. Braun, Pasadena, and Joseph D. Neuls, Los Angeles, Calif. - Calif. Cyanide Co., New York, N. Y. - Apparatus used to gasify liquid hydrocyanic acid or other poisonous liquid by heat and to conduct it to a tent or other enclosure is purged of poisonous gas by passing steam through it.

1,499,305 (June 24, 1924; appl. Aug. 17, 1923). COTTON FUMIGATOR. Bernard J. Lammers, Louisville, Ky. - This device consists of a canopy provided with a train for enveloping many plants, and is held in position by supports mounted on a base. Fumigant receptacles are provided for the reception of a chemical from which poison fumes are derived. This apparatus is particularly adapted to be used with cotton plants for the destruction of the boll weevil.

1,513,137 (Oct. 28, 1924; appl. Aug. 15, 1923). APPARATUS FOR FUMIGATING TREES, PLANTS, AND OTHER VEGETATION. Sigmund Tarnok, Macon, Ga. - Tarnok, Inc., La. - This machine applies to a mixture of steam and a volatilized insecticide to plants. If the chemical used is of a nature to produce an oily smudge it is stated that the insects are almost instantly killed.

1,513,138 (Oct. 28, 1924; appl. Nov. 19, 1923). METHOD OF FUMIGATING. Sigmund Tarnok, Macon, Ga. - Tarnok Inc., New Orleans, La. - This apparatus applies a hydrocarbon smudge to growing plants.

1,518,434 (Dec. 9, 1924; appl. Dec. 19, 1923). FUMIGATING TENT. Emil A. Klein, Los Angeles, Calif. - A fumigating tent which can be readily applied to the plant or tree to be fumigated and which can be operated without resting on the branches of the tree and which may be effectively sealed at the lower edge of the tent on the ground line is described.

1,519,434 (Dec. 16, 1924; appl. Mar. 29, 1921). METHOD OF GENERATING HYDROCYANIC-ACID GAS. Charles S. Banks, Manila, Philippine Islands. - Objects to be fumigated are placed in this fumigating chamber and exposed to HCN which is generated by intermingling sprays of sulphuric acid and of an alkali metal cyanide solution.

1,529,785 (Mar. 17, 1925; appl. Apr. 30, 1923). FUMIGATION. Harry W. Hammond and Archie O. Davis, Highland, Calif. - Calif. Cyanide Co., Los Angeles, Calif. - Liquid hydrocyanic acid is volatilized and the temperature of the air within a fumigating tent is raised by exhaust gases from a combustion motor.

1,530,371 (Mar. 17, 1925; appl. Mar. 3, 1924). RODENT, VERMIN, AND FUNGUS EXTERMINATOR. Harold W. Johnstone, James, R. Southworth, and Frank R. Brann, Visalia, Calif. - This portable apparatus distributes carbon disulphide to burrows or other places by means of an air pump.

1,534,734 (Apr. 21, 1925; appl. Nov. 23, 1923). INSECT AND NEST DESTROYER. John C. Porter, Woodstown, N.J. - Burning kerosene-soaked cotton in a holder is held under an insect nest on a tree by means of a pole.

1,542,175 (June 16, 1925; appl. Dec. 13, 1923). GREENHOUSE FUMIGATING LAMP. William H. Robinson, Morton Grove, Ill. - This lamp attracts night flying insects which fall into water in a trough and it can also be used to volatilize fumigating material such as tobacco and nicotine for combating leaf roller and other insects.

1,552,902 (Nov. 24, 1925; appl. Feb. 15, 1924). FUMIGATING APPARATUS. Floyd J. Metzger, New York, N. Y. and Joseph D. Neuls, Los Angeles, Calif. - Calif Cyanide Co., New York, N.Y. - This self propelled fumigating unit vaporizes liquid HCN by heat from the exhaust gases of an internal combustion engine.

1,568,983 (Jan. 12, 1926; appl. May 18, 1923). GASSING HOOD. Gaston J. Lipscomb, New York, N. Y. - This hood is placed over a row of cotton plants and the boll weevils are fumigated with gas from a cylinder. This gas is made by heating together crude oil and commercial sulphur.

1,574,408 (Feb. 23, 1926; appl. Apr. 17, 1925). SMOKE PUMP. Vittorio Oreggia, San Remo, Italy. - A cylindrical bee smoker with cylindrical bellows is described.

1,589,151 (June 15, 1926; appl. Jan. 30, 1925). INSECT DESTROYER. Luther M. Harlan, Warren, Ark. - This machine places a cover over cotton or other growing plants and blows poisonous gas such as sulphur fumes upon them.

1,591,083 (July 6, 1926; appl. Feb. 28, 1924). INSECT DESTROYER. George, G. Erdos, Brooklyn, N.Y. - Steam for killing insects is generated in this portable device by an electric heater.

1,593,663 (July 27, 1926; appl. Feb. 11, 1926). APPARATUS FOR FUMIGATION. Floyd J. Metzger, New York N.Y., and George J. Wegerer, Bell, Calif. - Calif. Cyanide Co., New York, N.Y. - This apparatus is designed for producing and applying a dust cloud of calcium cyanide in a gaseous medium such as air or CO₂. A weighed portion of the dust is blown by a blast from a bellows through a hose to a fumigating tent.

1,597,759 (Aug. 31, 1926; appl. June 8, 1922). PROCESS OF FUMIGATION. Frederick W. Brann, Los Angeles, Calif. - Calif. Cyanide Co. Del. - This apparatus delivers a measured quantity of liquid hydrocyanic acid to a fumigating tent by means of steam.

1,611,271 (Dec. 21, 1926; apol. Sept. 5, 1923). TENT PULLER. Harry W. Hammond and Archie O. Davis, Highland, Calif. - Calif. Cyanide Co. - This apparatus for placing a fumigation tent over a tree is mounted on a truck and is actuated by power.

1,613,186 (Jan. 4, 1927; appl. May 7, 1924). FUMIGATING PROCESS. Ernest C. Moffett, Woodbridge, N.J. - American Cyanamid Co., New York, N.Y. - A mass of grain is fumigated by treating a portion of it with hydrocyanic acid (either liquid or gaseous) and distributing the hydrocyanic acid throughout the remainder of the mass of grain by means of a current of air.

1,614,015 (Jan. 11, 1927; appl. Sept. 19, 1922). APPARATUS FOR FUMIGATING. Joseph D. Neuls, Los Angeles, Calif. - Calif. Cyanide Co. Del. - A mixture of 80% liquid hydrocyanic acid and 20% water is vaporized in a coil by heat from automobile exhaust gases and is discharged into a fumigating tent.

1,614,355 (Jan. 11, 1927; appl. Aug. 12, 1925). PLANT-TREATING DEVICE. Fay O. Farwell, Toledo, Ohio. - This portable device delivers a measured quantity of calcium cyanide (or lime-nicotine, tobacco dust or other dust or gas) beneath a hood or tent over a plant or tree.

1,617,155 (Feb. 8, 1927; appl. Dec. 23, 1924). CHEMICAL CONTAINER. David G. Griffin, Chattanooga, Tenn. - This perforated cylinder is attached to a plow and distributes to plants under cultivation fumes for a burning chemical.

1,618,775 (Feb. 22, 1927; appl. Mar. 22, 1924) FUMIGATING APPARATUS. Joseph D. Neuls, Los Angeles, Calif.- Calif. Cyanide Co., New York. N.Y. - This pump delivers a measured quantity of liquid HCN beneath a fumigating tent.

1,630,016 (May 24, 1927; appl. Oct. 26, 1923). BOLL-WEEVIL EXTERMINATOR. John W. Kisselburg, Purcell, Okla. - One-Half to LaFayette A. Reeves, Pauls Valley, Okla. - This machine draws a hood over cotton plants and kills the boll weevils on them by poisonous smoke made by burning a powder.

1,634,354 (July 5, 1927; appl. June 5, 1924). FUMIGATING APPARATUS. Paul M. Gross and Robert B. Arnold, Durham, N.C. - Tobacco By-Products and Chemical Corp., Del. - A mixture of ground tobacco stems, added nicotine and potassium nitrate is burned in a can with a hole in the top through which the gases escape. Combustion is started by lighting a fuse. This mixture is described in United States Patent 1,412,065 dated Apr. 11, 1922.

1,637,254 (July 26, 1927; appl. June 20, 1924). BOLL-WEEVIL EXTERMINATOR. Etienne F. Gomez, New Orleans, La. - This machine consists of a sled with ovens for burning sulphur or other chemical and means for distributing the fumes to the cotton plants.

1,640,026 (Aug. 23, 1927; appl. Oct. 12, 1926). FUMIGATOR. John O. Burt, Memphis, Tenn. - This device is a metal cylinder adapted to contain and distribute fumigating material.

1,641,097 (Aug. 30, 1927; appl. Apr. 15, 1925). MEANS FOR STERILIZING COTTON AND OTHER SEEDS. Parrish H. Rylander, Austin, Tex. - Rylander, Co., Austin, Tex. - This apparatus kills insects in cotton seed by the application of live steam.

1,641,712 (Sept. 6, 1927; appl. Feb. 5, 1926). APPARATUS FOR GAS-TREATING ARTICLES. Albin H. Warth, Baltimore, Md. - The Crown Cork & Seal Co., Baltimore, Md. - This device consists of a cylinder for holding cork discs and plugs with connection at both ends for admitting a toxic gas that will destroy mold spores, bacteria, fungous growths, yeast and insect larvae. Reference is made to United States Patent 1,524,494 issued Jan. 27, 1925 to A. H. Warth.

1,642,306 (Sept. 13, 1927; appl. Mar. 18, 1927). INSECT EXTERMINATOR. Joseph T. Monte, Chisholm, Minn. - This device consists of a tank of liquid insecticide which is conducted out and evaporated by means of wicks. The device is to be set in a clothes closet where the fumes will destroy moths, or suspended from a mattress or used in a chicken-house.

1,642,920 (Sept. 20, 1927; appl. Apr. 6, 1921). FUMIGATING APPLICATOR. Kenneth F. Cooper, Great Neck, N.Y. - American Cyanamid Co., New York, N.Y. - This pump measures and applies measured quantities of volatile liquid fumigants such as hydrocyanic acid.

1,646,767 (Oct. 25, 1927; appl. May 17, 1927). RODENT AND INSECT EXTERMINATOR. Andreas Schille, Mannheim, Germany. - Forty percent to Jacob Wissing, New York, N.Y. - This cylinder holds a cartridge which contains a special material adapted to be exploded and to develop a heavier than air gas toxic to rodents and insects.

1,655,540 (Jan. 10, 1928; appl. Jan. 29, 1927). MOTH EXTERMINATOR. Arthur C. Friedel, Syracuse, N.Y. - This moth exterminator for use in wardrobes consists of an aluminum tray in which naphthalene or camphor is volatilized by heat from an electric lamp.

1,659,097 (Feb. 14, 1928, appl. Sept. 28, 1926). STEAMING AND DRYING APPARATUS. Charles Gygi, Norfolk, Va. - A garment on a hollow foraminous form may be steamed or fumigated.

1,662,738 (Mar. 13, 1928; appl. Sept. 6, 1927) SANITARY DEVICE FOR REPELLING MOSQUITOES AND OTHER INSECTS. Charles P. Coogle, Greenwood, Miss. - United States of America. - This wire mesh cylinder is intended to hold naphthalene or camphor balls.

1,663,646 (Mar. 27, 1928; appl. Nov. 4, 1926). GARMENT HANGER. Rubin Bass, Brooklyn, N.Y. - This coat hanger has a track-way for moth balls.

1,668,068 (May 1, 1928; appl. May 9, 1925). VAPORIZER FOR VACUUM FUMIGATION. Shelley I. Gleason, Los Angeles, Calif. - Union Tank and Pipe Co., Los Angeles, Calif. - This fumigating chamber is designed for treating potatoes, almonds, raisins, etc. with CS_2 vapor.

1,668,496 (May 1, 1928; appl. June 3, 1926). METHOD FOR DISTRIBUTION OF VOLATILE SUBSTANCES. Frederic A. Eustis, Milton, Mass. - Virginia Fruit Fumigating Co., West Norfolk, Va. - A method for the uniform diffusion of SO_2 in a box car of fruit comprises supplying heat to the liquid sulfur dioxide to volatilize and generate a high pressure in the resulting gas, without appreciable rise in temperature, conducting the latter in the form of a fine stream into an irregularly disposed volume of air, introducing air into the sulfur dioxide stream, and thereafter leading the combined gaseous stream into the gaseous medium.

1,670,344 (May 22, 1928; appl. Mar. 5, 1926). DUSTING APPARATUS. Charles D. Collins, New York, N.Y. - American Cyanamid Co., New York, N.Y. - This apparatus measures and ejects a solid fumigant such as calcium cyanide.

1,672,326 (June 5, 1928; appl. Jan. 30, 1925; in Australia Feb. 14, 1924). PROCESS FOR THE TREATMENT OF TIMBER FOR THE DESTRUCTION OF THE BORER, LARVAE, BEETLES, OR OTHER PEST. Adolf M. Kobiolke, Galderoy, Victoria, Australia. - Timber infested with insects is subjected to a vacuum in this apparatus, dried by heat and then treated with poisonous fumes (preferably tobacco fumes) at atmospheric or higher pressure.

1,675,123 (June 26, 1928; appl. Oct. 23, 1926). METHOD OF AND APPARATUS FOR FUMIGATING. Floyd J. Metzger, New York, N.Y., and George C. Bauer, Los Angeles, Calif. - Calif. Cyanide Co., New York, N.Y. - This apparatus generates and applies hydrocyanic acid gas from calcium cyanide.

1,704,607 (Mar. 5, 1929; appl. July 16, 1925; Renewed July 3, 1928). FUMIGANT CARTRIDGE. Harry W. Houghton, Glen Echo, Md. - Safety Fumigant Co., Boston, Mass. - This cartridge contains a mixture of a cyanide and bleaching powder adapted to generate cyanogen chloride and hydrocyanic acid. Reference is made to United States Patent 1,521,537 issued Dec. 30, 1924, to H.W. Houghton.

1,719,361 (July 2, 1929; appl. Oct. 22, 1924). METHOD OF FUMIGATING. Hal P. Eastman, Azusa, Calif. - Owl Fumigating Corp., New York, N.Y. - A process of treating trees with a volatile fumigant for pest control consists of dividing a normal dose of the fumigant heretofore discharged under the tent in one volume into two unequal parts, applying the greater part of the dose which is adapted to maintain gas concentration above minimum insecticide efficiency for approximately one-half the period of exposure necessary for complete destruction of pests without such excessive initial concentration as to injure the trees, and applying the lesser part of the normal dose before the expiration of said first half of the period of exposure, said lesser part of the dose being adapted to reestablish approximately the original gas concentration so as to continue gas concentration in excess of minimum insecticide efficiency for the remainder of the period necessary for effective pest destruction.

1,719,940 (July 9, 1929; appl. Aug. 15, 1928). FUMIGATED FURNITURE. Luther D. Lichty, New York, N.Y. - John G. Noll, Leonia, N.J. - This mechanism is to be used in conjunction with the springs of upholstered furniture, so that the depression of the seat of the chair against the tension of the springs, will forcibly eject the fumes of an insecticide throughout the various hollow spaces of a chair covered with the upholstery in a manner to ensure an adequate supply of such fumes to ensure their penetration about all parts of the chair where moths or other insects might conceal themselves.

1,721,869 (July 23, 1929; appl. June 27, 1927). PEST EXTERMINATOR. Eben Montgomery, Waco, Tex. - This machine places a canopy over cotton plants and applies sulphur fumes and also powdered sulphur to them.

1,723,955 (August 6, 1929; appl. Dec. 1, 1923). APPARATUS AND METHOD FOR AGRICULTURAL SPRAYING. John E. Shepherd and Edwin K. O'Brien, Charlottesville, Va. - Belle Mead Development Corp., Charlottesville, Va. - This apparatus utilizes a blast of steam as an atomizer and carrier for insecticides, oils, sulphur, fertilizers, etc. The heat of the steam is also used to kill pests and the force of the steam to dislodge them.

1,725,650 (Aug. 20, 1929; appl. July 27, 1927; in Australia Aug. 10, 1926). PROCESS FOR THE DESTRUCTION OF INSECT PESTS. Adolf M. Kobiolke, Gilderoy, Australia. - The fumigating gas is preferable carbon disulphide vapor but a gas formed from a pyrethrum base may be used.

1,727,995 (Sept. 10, 1929; appl. May 31, 1927; in Germany June 3, 1926). APPARATUS FOR DISINFECTING AND EXTIRPATING VERMIN BY MEANS OF A STEAM BOILER. Wilhelm Lechler, Munich, Germany. - Steam generated in a boiler is superheated to from 150° to 200°C. just before it issues from the discharge nozzle. Heating may be effected by gas, spirits, kerosene, raw oil or electricity. On its way to the superheater the steam may have added to it a disinfectant or insecticide which is discharged with the superheated steam.

1,728,157 (Sept. 10, 1929; appl. Apr. 26, 1927). FUMIGATING DEVICE. Carey C. Winchester, Atlanta, Ga. - National Cedarchex Corp., Fulton County, Ga. - Volatile insecticide in a bottle is vaporized by means of a wick. The holder of the bottle is preferably constructed of cedar or similar aromatic woods adapted to blend with the fumigating substance.

1,732,028 (Oct. 15, 1929; appl. Sept. 24, 1927; Renewed Mar. 12, 1929). INSECT REPELLENT. Harry M. Reiner, New York, N.Y. - Reiner Products, Inc., New York, N.Y. - Fibrous material impregnated with a liquid repellent such as citronella is contained in a device which comprises a pair of telescopic members, in rotative relation, and adapted to present a series of registering apertures or ports from which the vapors may issue into the surrounding air.

1,732,191 (Oct. 15, 1929; appl. Mar. 29, 1927). CANVAS-HANDLING MECHANISM. Ernest E. Evans, Riverside, Calif. - This machine is mounted on a truck and is designed to convey and erect a canvas cover such as is used for covering trees for fumigating purposes.

1,736,091 (Nov. 19, 1929; appl. Jan. 11, 1927; in Germany Sept. 14, 1925). DEVICE FOR THE PRODUCTION OF SMOKE AND THE LIKE. Erich Rademacher, Kahla, Germany. - A wire gauze protective container for a fumigating candle is described.

1,741,359 (Dec. 31, 1929; appl. Oct. 23, 1928). INSECT-DESTROYING MACHINE. Andrew B. Camden, Durant, Okla. - One-Half to Porter Neuman, Durant, Okla. - This machine discharges poisonous smoke upon rows of growing plants.

1,742,149 (Dec. 31, 1929; appl. Oct. 5, 1925; in Cuba Mar. 20, 1925). FUMIGATING APPARATUS. Hugo Roberts, Habana, Cuba. - This portable apparatus generates HCN from dilute sulphuric acid and a solution of potassium cyanide and distributes the gas through a nozzle to rat burrows and ant hills.

1,745,078 (Jan. 28, 1930; appl. May 11, 1925). SHIP-FUMIGATING APPARATUS. Charles D. Collins, New York, N.Y. - American Cyanamid Co., New York, N.Y. - This apparatus delivers a measured dose of liquid fumigant such as HCN, CNCl, CS₂ or methyldichloramine.

1,755,901 (Apr. 22, 1930; appl. Jan. 14, 1929). FUMIGATING DEVICE. Harry A. Searle, Council Bluffs, Iowa. - This device consists of a pan into which a volatile insecticide. (e.g. Mothene) flows from an inverted bottle.

1,756,414 (Apr. 29, 1930; appl. Apr. 14, 1928). FUMIGATING DEVICE. Carrey C. Winchester, Brookhaven, Ga. - National Cedarchex Corp., Fulton County, Ga. - This device for fumigating chests or rooms consists of a container from which a volatile liquid slowly escapes. The support for the container is preferably formed of an aromatic wood.

1,757,276 (May 5, 1930; appl. Apr. 27, 1927). METHOD OF FUMIGATING TREES. Clyde Vaughn, Pasadena, Calif. - A crane for transferring a fumigating tent from tree to tree is described.

1,759,033 (May 20, 1930; appl. Feb. 24, 1926; in Germany Feb. 26, 1925). SMOKE DEVICE. Walter Beck, Frankfort-On-The-Main, Germany. - Deutsche Gold & Silber Scheideanstalt, Vormal's Roessler, Frankfort-On-The-Main, Germany. - Poisonous fumes (e.g. H₂S and CO) generated by burning a cartridge in this container are introduced into the burrows of rats, termites, etc. by a pump or a bellows.

1,760,598 (May 27, 1930; appl. Feb. 21, 1928). INSECTICIDE CONTAINER. John P. Horn, Lancaster, Pa. - This container for a volatile insecticide is placed within the upholstery of furniture.

1,771,960 (July 29, 1930; appl. Apr. 13, 1928). INSECTICIDE CONTAINER. John P. Horn, Lancaster, Pa. - An object of this invention is to provide an insecticide container constructed and arranged whereby air currents are caused to pass therethrough on the compression and reaction of the seat of a chair or other resiliently supported part of an article of furniture, thereby carrying the emanations from the insecticide substance into contact with the upholstering material when one occupies the seat and rises therefrom.

1,773,582 (Aug. 19, 1930; appl. July 10, 1926). FUMIGATING APPARATUS AND METHOD OF FUMIGATING. Ralph M. Jackson, LaHabra, Calif. - Owl Fumigating Corp., New York, N. Y. - Liquid HCN is

vaporized and delivered to a fumigating tent by means of superheated steam. Reference is made to United States Patent 1,477,125 issued Dec. 11, 1923 to R. M. Jackson.

1,775,703 (Sept. 16, 1930; appl. May 19, 1927). PROCESS FOR DESTROYING INSECT LIFE ON VEGETATION. Charles L. Stokes, Los Angeles, Calif. - This apparatus destroys boll weevils on cotton plants by applying hot air (not in excess of 150°F) or other gas such as CO, CO₂, CS₂, HCN or a mixture of any or all of them under a pressure differing substantially from that of the atmosphere and suddenly restoring the pressure to that of the atmosphere.

1,792,860 (Feb. 17, 1931; appl. Mar. 16, 1929). METHOD OF APPLYING INSECTICIDES TO VEGETABLE MATTER. Joseph D. Neuls, Whittier, Calif. - This apparatus distributes a hydrocarbon smudge to plants by incompletely burning oil, paradichlorobenzene or other material which is carried by sawdust or a porous block of ceramic material such as pumice.

1,795,488 (Mar. 10, 1931; appl. Aug. 26, 1929). MEANS FOR ERADICATING INSECTS. Walter B. Hill, Memphis, Tenn. - Piping around the foundation walls of a building distributes liquid insecticide for combating termites.

1,796,130 (Mar. 10, 1931; appl. Oct. 4, 1930). CLEANING DEVICE. Julius Szodomka, New Orleans, La. - Liquids or powders in a chamber near this nozzle are blown out by steam, air or gas. The device can be used for fumigating and deodorizing ships' holds and other compartments.

1,809,279 (June 9, 1931; appl. Oct. 3, 1924). FUMIGATING APPARATUS. Kenneth A. Kilbourne, Azusa, Calif. - Owl Fumigating Corp., New York, N.Y. - This apparatus vaporizes a measured quantity of liquid HCN without any heating means.

1,812,535 (June 30, 1931; appl. May 26, 1930). METHOD AND MEANS FOR APPLICATION OF PARADICHLOROBENZENE TO FRUIT TREES. Morris Y. Kachline, Bangor, Pa. - This device consists of a cloth or woven wire tube uniformly charged with paradichlorobenzene at the rate of 1 ounce per linear foot.

1,814,504 (July 14, 1931; appl. Aug. 23, 1928). CYLINDER TYPE FUMIGATING APPLICATOR. Charles D. Collins, New York, N.Y. - American Cyanamid Co., New York, N.Y. - This pump for liquid HCN definitely measures the dosage per stroke.

1,817,532 (Aug. 4, 1931; appl. Apr. 18, 1928). TREATING MEANS FOR FABRICS. Abraham N. Spanel, Rochester, N.Y. - Garments in a rubberized fabric receptacle are fumigated by blowing air through a liquid or solid fumigant on to them with a household vacuum cleaner.

1,817,533 (Aug. 4, 1931; appl. June 11, 1928). TREATING MEANS FOR FABRICS. Abraham N. Spanel, Rochester, N.Y. - Garments in a rubberized fabric receptacle are fumigated by blowing air through a liquid or solid fumigant on to them with a household vacuum cleaner. The fumigant may be naphthalene, paradichlorobenzene, HCN, sulphur fumes, CS₂ or CCl₄.

1,817,534 (Aug. 4, 1931; appl. July 19, 1928). DEVICE FOR TREATING ARTICLES. Abraham N. Spanel, Rochester, N.Y. - A rubberized cloth receptacle in which blankets etc. may be fumigated is described.

1,817,535 (Aug. 4, 1931; appl. July 30, 1928). DISINFECTING AND AERATING DEVICE. Abraham N. Spanel, Rochester, N. Y. - This container for fumigating clothing has flexible walls.

1,817,536 (Aug. 4, 1931; appl. Aug. 31, 1928). MEANS FOR FUMIGATING AND DISINFECTING ARTICLES. Abraham N. Spanel, Rochester, N.Y. - A receptacle in which objects are fumigated with a liquid insecticide is described.

1,818,684 (Aug. 11, 1931; appl. Sept. 20, 1930). VAPORIZING DEVICE. Irving Blechman, New York, N.Y. - One of the principle uses of the present invention is to provide a device which may be hung in a closet to impregnate the air therein with insecticide fumes to kill or destroy moths or other insects in garments hung in the closet. In this device the flow of the liquid is automatic and is dependent upon the rate of evaporation.

1,819,900 (Aug. 18, 1931; appl. Oct. 26, 1929). FUMIGATING DEVICE. Edward T. Ladd, Lewiston, N.Y. - Isco Chemical Co., Niagara Falls, N.Y. - The principle object of this invention is to provide a chest so designed that when the cover thereof is closed, a definite charge of liquid or gas will be released within it. Chloropicrin is the preferred fumigant.

1,826,607 (Oct. 6, 1931; appl. June 8, 1928). METHOD AND APPARATUS FOR PROMOTING PLANT GROWTH IN GREENHOUSES. Michael A. Eiben, Cleveland, Ohio. - Desirable gases may be ejected into the greenhouse for controlling insects and disease. In addition, plants may be satisfactorily dusted by ejecting the dusting material into the blower and allowing it to be blown into the atmosphere above the plants.

1,842,844 (Jan. 26, 1932; appl. Aug. 3, 1927; in Great Britain Aug. 10, 1926). TREATMENT OF GROWING PLANTS AND FOR OTHER LIKE PURPOSES. John C. Savage, London, England. - Apparatus for spraying insecticide from an airplane is described. White arsenic, precipitated copper carbonate or copper hydrate in suspension in cottonseed oil or a suitable mineral oil is discharged into the exhaust manifold and a poison charged smoke is emitted from the airplane.

1,846,068 (Feb. 23, 1932; appl. Oct. 5, 1928). INSECTICIDE DISPENSER. Casper W. Sandehn, Rockford, Ill. - Libby Oil and Chemical Co., Rockford, Ill. - The container for volatile insecticides also serves as an automatic dispenser for the liquid when the closure is perforated and the container inverted.

1,848,412 (Mar. 8, 1932; appl. May 4, 1931). ANTIMOTH CAKE. Morris Bordman, Philadelphia, Pa. - An anti-moth cake which may be suspended in clothes closet to permeate the clothes with moth killing fumes is described.

1,851,430 (Mar. 29, 1932; appl. Mar. 27, 1931). FUMIGATING DEVICE. Clarence R. Hutchins, Jersey City, N. J. - An attachment for vacuum cleaners which is utilized to disseminate insecticides is described.

1,854,449 (Apr. 19, 1932; appl. Oct. 7, 1930). GUN TYPE DUSTING APPARATUS. Charles D. Collins, New York, N.Y. - American Cyanamid Co., New York, N.Y. - Calcium cyanide dust is distributed by the explosion from a blank cartridge.

1,856,062 (Apr. 26, 1932; appl. June 27, 1927). PACKAGE AND GENERATOR FOR FUMIGANT MATERIALS. Harry W. Houghton, Glen Echo, Md. - Safety Fumigant Co., Mass. - A can of solid material inert in a dry state but active toward an acid, comprises a tinned iron bottom and sides and a zinc top, the whole being protected by a coating of paraffine, and a tab adapted, when pulled, to remove a portion of said paraffine coating from said zinc top. The container contains coated sodium chlorate, sodium cyanide and a bottle of dilute HCl which generates a mixture of HCN and CNCl. Reference is made to United States Patent 1,521,537 issued Dec. 30, 1924 to H. W. Houghton.

1,863,511 (June 14, 1932; appl. Oct. 30, 1929). MOTH ERADICATOR. Roscoe C. Travis, Bowling Green, Va. - This container is primarily designed for receiving cedar wood in the form of wool with means to retain the fumes from the wood confined within the container until the device is put into use as an eradicator with the result that the eradicator can be stored or displayed for sale or otherwise for an indefinite period of time without fear of the cedar wood losing any of its strength.

1,863,584 (June 21, 1932; appl. May 18, 1931). APPARATUS FOR EXTERMINATING INSECTS. Pratt E. Tracy, Toledo, Ohio. - The Air-Way Electric Appliance Corp., Toledo, Ohio. - An open mouth bag adapted to be drawn over an article is used as a lethal chamber in which moths, etc. are destroyed by gas from a pulverulent material (paradichlorobenzene).

1,866,658 (July 12, 1932; appl. Nov. 10, 1930). VAPORIZING DEVICE. Abraham J. Lichtig, Oakland, Calif. - This device volatilizes cedar oil or other fumigant by means of a wick.

1,872,028 (Aug. 16, 1932; appl. Dec. 17, 1928). BLOWER DUSTING

APPARATUS. Charles D. Collins, New York, N.Y. - American Cyanamid Co., New York, N.Y. - This apparatus blows a powdered fumigant such as calcium cyanide upon vegetation.

1,872,676 (Aug. 23, 1932; appl. July 2, 1930). ART OF DESTROYING MOTH WORMS, ETC. William Y. Castonguay, Detroit, Mich. - This apparatus consists of an automobile truck bearing a fumigating chamber in which furniture and clothing are fumigated by exhaust gases from the engine.

1,785,247 (Aug. 30, 1932; appl. Aug. 1, 1930). CEDAR CHEST. Lawrence K. Loftin, Altavista, Va. - The Lane Co., Va. - The patent states that experiments conducted over many years have proven that the moth killing efficiency of a cedar chest is proportionate to the amount of cedar oil present in the closure and the aroma tightness of the closure.

1,880,325 (Oct. 4, 1932; appl. Aug. 1, 1930). MOTHPROOF RECEPTACLE. Lawrence K. Loftin, Altavista, Va. - The Lane Co., Va. - The object of this invention is to provide an aroma tight receptacle for the storage of clothing, etc., which receptacle may be of any desired type, chest, wardrobe, drawers, etc.

1,885,919 (Nov. 1, 1932; appl. July 17, 1931). MOTHPROOFING CABINET. Hyman Kliot, Bronx, N.Y. - Kliot Closet Moth Proofer, Inc., New York, N.Y. - This receptacle is intended to hold pellets of paradichlorobenzene and cedar oil in a clothes closet.

1,888,732 (Nov. 22, 1932; appl. Sept. 27, 1930). APPARATUS FOR INSECTICIDE DUSTING RUGS, UPHOLSTERY, AND CLOTHING. John R. Mathes, Dover, N.H. - The Expello Corp., Dover, N.H. - This attachment to a domestic suction cleaner is designed for blowing the vapor and fine powder of paradichlorobenzene into fabrics.

1,890,857 (Dec. 13, 1932; appl. Aug. 1, 1930). MOTHPROOF RECEPTACLE. Lawrence K. Loftin, Altavista, Va. The Lane Co., Va. - A cedar chest is described.

1,890,999 (Dec. 13, 1932; appl. Aug. 22, 1929). CEDAR CHEST. Lawrence K. Loftin, Altavista, Va. - The Lane Co., Va. - A cedar chest is described.

1,900,717 (Mar. 7, 1933; appl. July 7, 1925). CYANIDE APPLICATOR. Kenneth A. Kilbourne, Elizabeth, N.J. - American Cyanamid Co., New York, N.Y. - This apparatus discharges HCN by blowing moist air upon calcium cyanide.

1,908,054 (May 9, 1933; appl. Apr. 28, 1932). FUMIGATOR. Herbert E. Riley, New York, and Harry J. Tannenbaum, Far Rockaway, N.Y. - This device vaporizes a fumigant for protecting clothing by electrical heat.

1,908,055 (May 9, 1933; appl. Oct. 20, 1932). FUMIGATOR. Herbert E. Riley, New York, and Harry J. Tannenbaum, Far Rockaway, N.Y. - This device volatilizes paradichlorobenzene for exterminating clothes moths by an electrical heating unit.

1,911,871 (May 30, 1933; appl. Dec. 19, 1931). FUMIGATOR. Theodore A. Anderson, Fort Wayne, Ind. - Volatile insecticide drawn from a bottle by a wick is blown into the air by an electric fan.

1,912,209 (May 30, 1933; appl. July 9, 1930). METHOD AND APPARATUS FOR TREATING PLANTS. Harry C. Lassen and Henry Dahl, San Jose, Calif. - Food Machinery Corp., San Jose, Calif. - A method of treating plants in greenhouses and the like comprises introducing a liquid insecticide (e.g. nicotine) into said greenhouse in the form of a floating mist, and thereafter dissipating the mist of insecticide by introducing water therein in the form of a floating mist. The atomizer used sprays as little as 1/2 gallon of liquid per nozzle per minute under a pressure of 450 lbs. per sq. inch.

1,912,694 (June 6, 1933; appl. Jan. 25, 1932). MOTH KILLER RECEPTACLE. Bernard S. Donovan, Chicago, Ill. - This device consists of a pan for chemicals having moth killing properties which is placed in a moth proof chest.

1,913,571 (June 13, 1933; appl. May 18, 1932). MOTH EXTERMINATOR. Herman L. Strongsen, New York, N.Y. - This ball type moth exterminator, comprises a base portion containing a solidified chemical and a detachable apertured cover and an electric heating element disposed within the container in a manner to liquefy the chemical, whereupon a vapor fatal to moths escapes from the apertures.

1,930,588 (Oct. 17, 1933; appl. Dec. 24, 1931). FUMIGATING APPARATUS AND PROCESS. Charles E. Dibble, Lynwood, Calif. - This device distributes a fumigant by the exhaust gases from an internal combustion engine. For rodents the following mixture is appropriate, namely: 2 parts by weight of light cylinder oil, 3 parts by weight of concentrated ammonia (the last element is preferably XXX - ammonia dissolved in water). For hog houses, chicken coops, basements, and the like, the following mixture is appropriate: 3 parts of creoline, 3 parts of concentrated ammonia. For fumigating trees, shrubs, etc., the following formula is appropriate: 2 parts of light cylinder oil, 4 parts of (warm) sulphur water.

ASSIGNEE INDEX

(Numbers refer to patents cited)

Air-Way Electric Appliance Corp., 1,863,584

American Cyanamid Co., 1,454,154; 1,613,186; 1,642,920; 1,670,344;
1,745,078; 1,814,504; 1,854,449; 1,872,028;
1,900,717
Belle Mead Development Corp., 1,723,955
Calif. Cyanide Co., 1,497,428; 1,529,785; 1,562,902; 1,593,663; 1,597,759
1,611,271; 1,614,015; 1,618,775; 1,675,123
Cliot Closet Moth Proofer, Inc., 1,885,919
Conklin, Chester C., 1,322,149
Crown Cork and Seal Co., 1,641,712
Deutsche Gold & Silber Scheideanstalt, Vormal's Roessler, 1,759,033
Expello Corp., 1,888,732.
Food Machinery Corp., 1,912,209
Godfrey, Warren P., 1,295,397
Isco Chemical Co., 1,819,900
Lane Co., 1,875,247; 1,880,325; 1,890,857; 1,890,999
Libby Oil and Chemical Co., 1,846,068
National Cedarchem Corp., 1,728,157; 1,756,414.
Noll, John G., 1,719,940
Neuman, Porter, 1,741,359
Owl Fumigating Corp., 1,719,361; 1,773,582; 1,809,279
Pacific R. & H. Chemical Corp., 1,336,822; 1,426,831
Prue, H. M., 1,491,506
Reeves, LaFayette A., 1,630,016
Reiner Products, Inc., 1,732,028
Rylander Co., 1,641,097
Safety Fumigant Co., 1,704,607; 1,856,062
Tarnok, Inc., 1,513,137; 1,513,138
Tobacco By-Products and Chemical Corp., 1,634,354
Union Tank and Pipe Co., 1,668,068
United States of America, 1,662,738
Virginia Fruit Fumigating Co., 1,668,496
Wissing, Jacob, 1,646,767

PATENTEE INDEX

Alderson, Jacob T., and Alderson Sue F., 1,234,111
Alderson, Sue F., (See Alderson, Jacob T.)
Anderson, Theodore, A., 1,911,871
Arnold, Robert B., (See Gross, Paul M.)

Banks, Charles S., 1,519,434
Bass, Rubin, 1,663,646
Bauer, George C. (See Metzger, Floyd J.)
Beck, Walter, 1,759,033
Blochman, Irving, 1,818,684
Bordman, Morris, 1,848,412
Bottin, Georges, (See Durand, Leon)

Bram, Frank R., (See Johnstone, Harold W.)
Braun, Frederick W., 1,597,759
Braun, Frederick W., and Neuls, Joseph D., 1,497,428
Brown, Mortimer J., 1,426,831
Burt, John O., 1,640,026
Camden, Andrew B., 1,741,359
Camp, William W., 1,422,831
Castonguay, William Y., 1,872,676
Collins, Charles D., 1,670,344; 1,745,078; 1,814,504; 1,854,449; 1,872,028
Conceicao, Julio, 1,245,685
Coogler, Charles P., 1,662,738
Cooper, Kenneth F., 1,454,154; 1,642,920
Cuyler, Edward, H., and Patterson, Mark B., 1,336,822
Dahl, Henry, (See Lassen, Harry C.)
Davis, Archie O. (See Hammond, Harry W.)
Dibble, Charles E., 1,930,588
Dingle, William G., 1,304,747
Donovan, Bernard S., 1,912,694
Durand, Leon, and Bottin, Georges, 1,299,309
Eastman, Hal P., 1,719,361
Eiben, Michael A., 1,826,607
Erdos, George G., 1,591,083
Eustis, Frederic A., 1,668,496
Evans, Ernest E., 1,732,191
Farwell, Fay O., 1,614,355
Field, Eligah H., and Holman, William H., 1,468,230
Fowler, Gates M., 1,400,598
Friedel, Arthur C., 1,655,540
Garrison, Jacob T., 1,309,193
Geeslin, Robert W., 1,219,096
Gleason, Shelley I., 1,668,068
Gomez, Etienne F., 1,637,254
Graham, Thomas W., 1,233,371
Griffin, David G., 1,617,155
Gross, Paul M., and Arnold, Robert B., 1,634,354
Gygi, Charles, 1,659,097
Hammond, Harry W., and Davis, Archie O., 1,529,785; 1,611,271
Hanzadian, Paul G., 1,259,230
Harlan, Luther M., 1,589,151
Hawkins, Fletcher M., 1,225,627
Hill, Walter B., 1,795,488
Holman, William H., (See Field, Eligah H.)
Horn, John P., 1,760,598; 1,771,960
Houghton, Harry W., 1,704,607; 1,856,062
Hutchins, Clarence R., 1,851,430
Jackson, Ralph M., 1,773,582
Johnstone, Harold W., Southworth, James R., and Bram, Frank R., 1,530,371
Kachline, Morris Y., 1,812,535
Kilbourne, Kenneth A., 1,809,279; 1,900,717
Kisselburg, John W., 1,630,016
Klein, Emil A., 1,459,217; 1,518,434

Kliot, Hyman, 1,885,919
Kobiolke, Adolf M., 1,672,326; 1,725,650
Ladd, Edward T., 1,819,900
Lammers, Bernard J., 1,499,305
Lassen, Harry C., and Dahl, Henry, 1,912,209
Lochler, Wilhelm, 1,727,995
Lichtig, Abraham J., 1,866,658
Lichty, Luther D., 1,719,940
Lipscomb, Gaston J., 1,568,983
Loeb, Henry, 1,386,125
Loftin, Lawrence K., 1,875,247; 1,880,325; 1,890,857; 1,890,999
McLeod, John E., 1,355,489
Magness, Grover C., 1,292,624
Mathes, John R., 1,888,732
Mayes, Thomas, 1,371,801
Mellott, Norris O., 1,287,389
Metzger, Floyd J., and Bauer, George C., 1,675,123
Metzger, Floyd J., and Neuls, Joseph D., 1,562,902
Metzger, Floyd J., and Wegerer, George J., 1,593,663
Moffett, Ernest C., 1,613,186
Monte, Joseph T., 1,642,306
Montgomery, Eben, 1,721,869
Morrill, Austin W., 1,372,974
Neuls, Joseph D., 1,614,015; 1,618,775; 1,792,860
Neuls, Joseph D., (See Braun, Frederick W.)
Neuls, Joseph D., (See Metzger, Floyd J.)
O'Brien, Edwin K., (See Shepherd, John E.)
Oreggia, Vittorio, 1,574,408
Pack, Robert E., 1,213,129
Patterson, Mark B., (See Cuyler, Edward H.)
Perrings, John A., 1,377,273
Porter, John C., 1,534,734
Rademacher, Erich, 1,736,091
Reiner, Harry M., 1,732,028
Riley, Herbert E., and Tannenbaum, Harry J., 1,908,054; 1,908,055
Roberts, Hugo, 1,742,149
Robinson, William H., 1,542,175
Rylander, Parrish H., 1,641,097
Sandehn, Casper W., 1,846,068
Savage, John C., 1,842,844
Schille, Andreas, 1,646,767
Searle, Harry A., 1,755,901
Shepherd, John E., and O'Brien, Edwin K., 1,723,955
Shrader, Orville W., 1,386,283
Southworth, James R., (See Johnstone, Harold W.)
Spanel, Abraham N., 1,817,532; 1,817,533; 1,817,534; 1,817,535; 1,817,536
Stokes, Charles L., 1,755,703
Stone, William H., 1,295,079
Strongsen, Herman L., 1,913,571
Swain, Mack M., 1,322,149
Szodomka, Julius, 1,796,130

Tannenbaum, Harry J., (See Riley, Herbert E.)
Tarnok, Sigmund, 1,513,137; 1,513,138
Tracy, Pratt E., 1,863,584
Travis, Roscoe C., 1,863,511
del Valle, Francisco de Asis, 1,332,109
Van Meter, James W., 1,401,293; 1,419,653; 1,430,772
Vaugan, Clyde, 1,757,276
Warth, Albin H., 1,641,712
Watts, Ben, 1,295,397
Wegerer, George J., (See Metzger, Floyd J.)
Winchester, Carey C., 1,728,157; 1,756,414
Woodruff, Will R., 1,312,223
Wormley, Thomas C., 1,491,506

